



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/640,602	08/17/2000	Jonathan M. Owen	AM/DM:0004	4916

7590

06/21/2004

B. Noel Kivlin
Meyertons, Hood, Kivlin, Kowart & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398

EXAMINER

FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
----------	--------------

2663

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/640,602

Applicant(s)

OWEN ET AL.

Examiner

Derrick W. Ferris

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33-40, 42, 44-51, 53, 55-60 and 62 is/are rejected.
- 7) ☒ Claim(s) 41, 43, 52, 54, 61 and 63 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7.8.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. **Claims 33-63** as amended are still in consideration for this application. Applicant has canceled claims 1-32. Applicant has added claims 33-63.
2. Examiner **withdraws** the anticipated rejection to *Thorson* and *Yasuda* for Office action filed 04/15/04. In addressing applicant's arguments in the response filed 05/20/04, applicant has canceled the relevant claims rendering the rejection moot. However, examiner still notes a broad but reasonable interpretation of "posted request packet" in light of applicant's specification. In particular, applicant has amended the claims to further recite wherein a given posted request packet communicates a request that is considered completed by a source of the request upon transmission of the request by the source. Examiner reads the above-cited limitation as a request that does not use flow control. As such, *Thorson* teaches a maintenance channel that does not use flow control. In particular, see e.g., column 9, lines 1-10. Examiner has also supplied an additional rejection based on applicant's clarification of a posted request packet.
3. Examiner **withdraws** the obviousness rejection to *Thorson* in view of *Gaughan* for Office action filed 04/15/04. In addressing applicant's arguments in the response filed 05/20/04, applicant has canceled the relevant claims rendering the rejection moot.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

Art Unit: 2663

has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. **Claims 33-35, 37, 38, 44-46, 48, 49, and 55-57** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,055,618 A to *Thorson*.

As to **claim 33**, figure 7 shows a plurality of nodes. Figure 5 shows a plurality of virtual channels 50, 52, 54, 56, 58 and 60 where a maintenance channel 60 is dedicated to posted request packets. In particular, a maintenance channel uses no flow control, see e.g., column 9, lines 1-10, thus meeting the further limitation wherein a given posted request packet communicates a request that is considered completed by a source of the request upon transmission of the request by the source.

As to **claim 34**, see e.g., virtual channels 50, 52, 54, 56, and 58 in figure 5.

As to **claim 35**, see e.g., virtual channels 54 and 56 in figure 5.

As to **claim 37**, see e.g., buffers maintenance, VC0 and VC1 shown in figures 5 and 6.

As to **claim 38**, the maintenance buffer is dedicated since it is completely separate and it does not destroy the traffic, see e.g., column 9, lines 20-26.

As to **claim 44**, see similar rejection to claim 33.

Art Unit: 2663

As to **claim 45**, see similar rejection to claim 34.

As to **claim 46**, see similar rejection to claim 35.

As to **claim 48**, see similar rejection to claim 37.

As to **claim 49**, see similar rejection to claim 38.

As to **claim 55**, see similar rejection to claim 33.

As to **claim 56**, see similar rejection to claim 34.

As to **claim 57**, see similar rejection to claim 35.

6. **Claims 33-40, 42, 44-51, 53, 55-60, and 62** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,094,686 A to *Sharma*.

As to **claim 33**, *Sharma* teaches a multi-processor system for transferring data without incurring deadlock using hierarchical virtual channels. In particular, *Sharma* discloses the following three types of “command packets” with respect to a caching protocol: (1) request packets, (2) probe packets, and (3) response packets, see e.g., column 32, lines 40-46. Each of these different types of command packets are given different priorities based on the transaction state or hop position, e.g., see figure 23 in relation to Table II at column 42. In general, *Sharma* teaches request packets as QIO, Q0 and Q0Vic; and response and probe packets as Q1 and Q2 since Q1 and Q2 occur at later stages or hops. As *Sharma* discloses hierarchical virtual channels, the ordering is from lowest to highest with respect to QIO, Q0Vic, Q0, Q1 and Q2, see e.g., column 15, lines 56. At issue is the term posted request packet. With respect to applicant’s “posted” and “non-posted” request packets examiner notes QIO, Q0, and Q0Vic as examples of virtual channels since these carry request messages/packets over virtual channels. In particular

(although not claimed), QIO carries primarily reads and writes, see e.g., column 42, lines 36-38. Examiner notes various interpretations of the further limitation wherein a given posted request packet communicates a request that is considered completed by a source of the request upon transmission of the request by the source. One possible interpretation is the QIO channel which is added to *eliminate flow dependence cycles* between response messages from the IO system and memory space commands from the IO system, see column 41, lines 35-37. Flow dependence is defined by *Sharma* as M1 does not make progress until M2 at column 40, lines 37-54 (i.e., note the difference between flow dependence and resource dependence which both read on the above limitation). Another possible interpretation is the type of command such that other types of commands may also read on the above-limitation. For example, a read RD command or a read modify Rmod may read on the above-limitation since these requests may not require an acknowledgment. Finally, a third possible interpretation includes the type of buffering with respect to whether or not the above limitation is met. Specifically, each discrete transaction for a given command packet is allocated to a channel, see e.g., column 41, lines 46-47 and one implementation of virtual channels in a switch-based system involves the use of physically distinct queues, buffers or paths for each channel, see e.g., column 42, lines 60-67. Since Q0 and QoVic contain at least one dedicated or reserved slot (QIO may not contain a reserved slot since it is the lowest priority), one could argue the above limitation is met since the system need not worry whether space is available when sending a request, see e.g., column 23, lines 13-30. Specifically, *Sharma* teaches that the global port may always transfer dedicated packet data to the hierarchical switch if the

dedicated slot corresponding to the dedicated packet type is available in the buffer of the hierarchical switch. Thus flow control may be deserted for one cycle and then reasserted in another cycle.

As to **claim 34**, see e.g., Table II at column 72 where examples of non-posted request packets include Q0 and Q0Vic.

As to **claim 35**, see e.g., Q1 and Q2 in Table II at column 72 in reference to column 42, lines 1-9.

As to **claim 36**, see e.g., column 32, lines 40-46 in view of column 41, lines 50-60 since probe packets are commands and commands are given dedicated channels.

As to **claim 37**, buffers can either be dedicated or shared, see e.g., column 41, lines 20-29 and column 42, lines 60-67.

As to **claim 38**, see similar rejection to claim 37.

As to **claim 39**, see command types in Table II at column 42 in reference to either the write commands for QIO or the write command for Q0VIC.

As to **claim 40**, see e.g., column 28, lines 16-47 with respect to pushing.

As to **claim 42**, see e.g., column 29, lines 1-20 with respect to a dependency flag.

As to **claim 44**, see similar rejection to claim 33.

As to **claim 45**, see similar rejection to claim 34.

As to **claim 46**, see similar rejection to claim 35.

As to **claim 47**, see similar rejection to claim 36.

As to **claim 48**, see similar rejection to claim 37.

As to **claim 49**, see similar rejection to claim 38.

Art Unit: 2663

As to **claim 50**, see similar rejection to claim 39.

As to **claim 51**, see similar rejection to claim 40.

As to **claim 53**, see similar rejection to claim 42.

As to **claim 55**, see similar rejection to claim 33.

As to **claim 56**, see similar rejection to claim 34.

As to **claim 57**, see similar rejection to claim 35.

As to **claim 58**, see similar rejection to claim 36.

As to **claim 59**, see similar rejection to claim 39.

As to **claim 60**, see similar rejection to claim 40.

As to **claim 62**, see similar rejection to claim 42.

Allowable Subject Matter

7. **Claims 41, 43, 52, 54, 61, and 63** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US006243781B1 discloses both posted and non-posted request packets, however, the reference does not appear to teach virtual channels.

Art Unit: 2663

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Derrick W. Ferris
Examiner
Art Unit 2663


DWF


CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

6/16/04